

I. Location of Proposed Action

Kelmine Corporation, P.O. Box 272, Naturita, Colorado, proposes to establish a (modified underground) room and pillar uranium mine near the Utah-Arizona border in Southern San Juan County. Specifically, in the legal subdivision of Section 36, Township 43 South, Range 14 East, Salt Lake Meridian.

The area to be affected constitutes Utah State minerals Lease ML-33315, which covers 605 acres of Section 36, Township 43 South, Range 14 East, SLM. The NW $\frac{1}{4}$, NW $\frac{1}{4}$, of Section 36, is not included in this lease. The property lies within the Navajo Indian Reservation and access is subject to the United States Department of Interior, Bureau of Indian Affairs. approval. Kelmine Corporation presently holds a temporary exploratory access permit from the Navajo Tribal Council as well as a Utah State Exploratory Permit. The Tribal Council Permit expires December 29th 1977, and there is no time limit on the State Permit.

The proposed mine is named the Oljeto Mine and lies within the Monument Vally Uranium District.

II. Description of Proposed Action

Kelmine Corporation, through exploratory drilling, has outlined two small tonnage uranium deposits which they plan to mine as separate units, namely the east channel and the west channel. Each deposit will be developed by sinking minus fifteen percent (-15%) declines to the ore horizon with diesel-powered equipment. The proposed east channel decline will be 480 feet in length and the proposed west channel decline will be 450 feet in length. Abandoned declines from previous operations cannot be used as they are too steep for proposed rubber-tired equipment, and they are flooded, making them unsafe.

The mining method to be employed for the two deposits is the modified room and pillar method. The main haulage will be driven along the strike of the scour and if possible, will be in the ore zone. The stopping operation will be done from the main haulage with waste pillars, and ore pillars where necessary, left for ground support. Mining and development will be done with either rubber-tired or track/crawler loader and rubber-

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 .52 \\
 43560 \overline{) 22500.00} \\
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 150 \\
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tired, diesel-powered, three ton trucks. A main electrical generator will be used to provide 460 volt power for the operation of an air compressor for pneumatic rock drills and for ventilation fans. Surface runoff water collected in abandoned declines will be used for drilling and dust abatement. Potable water will be trucked in.

As two separate ore deposits occur on the Lease, two surface sites will be needed to develop the lease. The east channel site will be located 800 feet north of the Utah-Arizona border and 2,000 feet west of the east boundary of Section 36. This site will be located on a south facing hillside about 300 feet north and 15 feet higher than a westerly trending dry wash. A ten foot cut and fill site approximately (150 feet long and 75 feet wide) for service buildings is proposed. Approximately 4,000 tons of waste rock generated from an eight foot by eight foot decline will be deposited on the surface along the contour adjacent to the prepared site. The toe of the waste dump will be above the flood plain of the wash and will run parallel to it. The 1½ acre dump will have an average depth of 7½ feet, and will be composed of basically the same sandstone and clay that outcrops on Section 36.

The proposed west channel deposit lies approximately 1800 feet north and 3400 feet west of the southeast corner of Section 36. An eight foot cut and fill surface facility location will be constructed on a gently south sloping flat, located 300 feet east and 15 feet above a southwesterly trending dry wash. It will be approximately (150 feet by 75 feet) cut along the contour with approximately 3500 tons of waste rock deposited adjacent to and along contour with the cut site. The combined area of the surface facility site and the dump should be about 1½ acres.

Like the east channel site, (the toe of the waste dump will not encroach upon the wash.) but it does now! It is in wash as of last trip.

Road access across Utah State Land to the mine sites will require improvement of 2500 feet of an existing 15 foot wide roadway. The improvements will consist of grading sandy sections of the road and blasting the rocky

@ 11250 ft² =

11250 ft² =

11250
x 2
= 22500 sq ft
= @ .52 A (pads)
+ 1½ A (waste dump)
Total 2.02 A

None observed at site

sections with sandstone and waste rock. Culverts will be placed at wash crossings. Maximum road grade will be ten percent, and all work will be done with a crawler tractor.

Reclamation techniques will include stripping the red surface material, stockpiling it, and respreding the material over the gray spoils after the sites have been regraded to conform to the natural topography. A grass-shrub mixture will be planted when surface moisture is maximum. Kelmine's proposed seed mixture is russian wildrye-2 lbs./ac., indian ricegrass-1 lb./ac., sand dropseed-1 lb./ac., four wing saltbrush-1 lb./ac., and crested wheatgrass-1 lb./ac. The seed mixture may be modified by the Division of Oil, Gas, and Mining. (The portals will be closed, all material containing $U_3 O_8$ will be removed, and all structures and foreign matter will be removed.)

Road reclamation will include removal of culverts and waste rock will be removed and deposited in waste rock dumps. The roadway will be regraded and covered with available nearby material so as to blend with surroundings with respect to topography and color. The roadway will be reseeded with the aforementioned seed mixture. Reclamation of the mine site and roadway will commence at the termination of mining and will be completed within a period of a year.

III. Description of Existing Environment

A. Topography and Surface Drainage

The proposed mine site lies at an elevation of approximately 5250 feet on a rolling mesa that rises gently to the northeast. The west and north sides of the mesa drop off steeply into deep gulches and canyon rims. Surface water drainage is generally to the southwest on the mesa top. However, surface drainage on the valley floor surrounding the mesa is to the north through Oljeto Wash, an intermittent stream. The stream bed is used extensively for vehicular traffic. The surface of the mesa top is extensively cut by ephemeral stream channels.

B. Mining History and Geology

Between the early 1950's and mid 1960's approximately 11,000 tons of .61% U_3O_8 was shipped from the three mines which underlie Sec. 36 (ERDA records, Grand Junction, CO.). Two of these mines are connected; The Fern, which lies just south of the Utah-Arizona border, is connected to the Radium Hill mine on the Utah side of the border. Both of these mines were operated on the same scour and between them produced 9,000 tons. The third mine, the Utah Mine, is not connected to the other two and lies in another channel scour to the west. All three mines were operated with steep declines, using hoists, and track haulage. No commercial electric power is or was available and all power is or was diesel/generated or straight diesel power. Data as to mine workings is either missing or unavailable, as only the mine map for the Fern Mine to the Arizona border was located. Kelmine Corporation, starting in January, 1977, set up a transit control net to locate the Sec. 36 boundaries, the mine portals and previous drill holes. The southeast corner of Sec. 36, was arbitrarily set as 100,000N, 100,000E. Since the mines were flooded from surface runoff, no underground survey was done. Several drill holes were located and surveyed, as well as probed. No probe data was ascertained as all the holes were closed at about 45 foot depth and the ore occurring from 80 to 120 feet as stated on the available Fern Mine maps.

How is this explained or documented?

After lining up the mines an assumed trend was established and Kelmine initiated a drilling program on March 2nd. By March 27th 1977, 150 holes totalling 14,865 feet were drilled. Two basal Chinle mineralized scours and the extent of the mine workings were outlined.

Geology

The mine site is underlain by Chinle sandstone, pebble conglomerates, mudstone and siltstone, all of fluvial origin. The uranium ore is contained within the basal member of the Chinle, namely the Shinarump member which fills channel scours in the Triassic Moenkopi Formation. The basal sandstone channel fillings are cut by later sandstones forming numerous phases of cross bedding and discontinuous lensing of clays.

The only structural feature, according to Kelmine, is the Oljeto syncline which strikes north-south and runs along the west border of Section 36. The plunge of the synclinal axis is southerly giving the mesa a dip of three to five degrees to the south.

The drilling done by Kelmine Corporation outlined two small scours. One, the east channel begins in Arizona and forms the south end of the Fern Mine and strikes N31°W for 2,000 feet. Fourteen hundred feet of the scour has been mined through the now abandoned Fern and Radium Hill mines. The width averages 25 feet with mineralization from one to over four feet thick with the thickest sections and highest grades forming in the center of the scour. The basal sands thin and generally the grade decreases towards the flanks where finally the basal sand disappears. At the north end the sand filled scour disappears against a clay bank. This scour dissipates and becomes very subtle with an absence of mineralization. The depth to the top of the Moenkopi was between 100 and 120 feet.

The second scour lies parallel 500 feet west and is offset to the north such that the north end of the east channel terminated about due east of the beginning of the south end of the west channel. The second scour, the west channel, did not produce the dramatic mineralization/scour relationship.

Although the scour filling is present, strong mineralization did not always occur. The best thickness of mineralization occurred in a deep scour and at the outwash of the channel bends. The south end of the west channel is subtle with low grade mineralization. The scour is about 50 feet in width and continues along strike about 750 feet with good low grade mineralization and intermittent high grade spots. At the northern extent of the drilling, the channel shallows up with the scour splitting around a clay bank. The main split turns westerly for 100 feet then back NW. These two bends yield ore grade mineralization and thicknesses. From this point on, no data is available. The drilling does not indicate a connection between the east and west channel scours. The depth to the top of the Moenkopi in this scour ranged from 60 to 90 feet. No significant ground water was encountered in the drill holes.

Some dampness occurred at the base of the scour.

C. Climate

As there are no climatological or water monitoring stations in the immediate area, the following data was obtained from statewide maps published in the Hydrologic Atlas of Utah:

January mean maximum temperature.....44⁰ F.
January mean minimum temperature.....16⁰ F.
July mean maximum temperature.....93⁰ F.
July mean minimum temperature.....64⁰ F.
Normal annual precipitation..... 7 inches
Normal October-April precipitation..... 4 inches
Normal May-September precipitation..... 3 inches
Mean annual evapotranspiration.....27-30 inches
Normal Freeze Free Season.....160 days

Runoff Water Yields:

Mean annual water yield.....Less than one inch
10% time duration.....Less than 0.25 cfs/mi²
30% time duration.....Less than 0.2 cfs/mi²
50% time duration.....Less than 0.1 cfs/mi²
50 year flood yield..... 9 cfs/mi²

D. Hydrology

The surface drainage on the mesa top where the proposed mine is located is ephemeral. The soil is thin and discontinuous which causes "flashy" runoff events in response to precipitation. Vegetation is sparse leaving the soil exposed to surface runoff, thus creating high sediment yields that are deposited within the ephemeral channels. The three abandoned declines present on the lease are flooded. The source of the water is probably surface runoff rather than ground water as no significant ground water was encountered during exploratory drilling.

The proposed mines will tunnel into the Shinarump member of the Chinle Formation possibly to a depth of 120 feet. The operation will not intercept ground water. There are no known water wells in the immediate area.

*Now 1200-2000 g/day
produced & pumped
from one body
itself.*

*it does
intercept
G-W now!*

Water has been produced from the Shinarump member by an oil well in Township 24 South, Range 13 East, yielding 5750 ppm. dissolved solids. This water is classed as moderately saline.

E. Soils

A soil geochemical analysis performed by Polar Resources of Elko, Nevada for Kelmine, found that the soil is a reddish clay bed overlying the Chinle Formation. The ph of the soil and underlying sandstone is 7.0. The clay-soil horizon is only 12 to 18 inches thick in places and less in others. Much of the surface is exposed Chinle sandstone.

F. Vegetation

The vegetation zone is desert grassland and the following species were observed during a field inspection by the Utah Division of Oil, Gas, and Mining: sand dropseed, thistle, yucca, broom snakeweed, galletta grass, rabbitbrush, ephedra, cliffrose, juniper, pinyon, threeawn, and blue gramma. Natural revegetation of previous mine disturbance has occurred to some extent.

G. Range

The mining area is presently grazed by local Navajo's sheep and goats.
The present range is in good condition and not overgrazed.

who's determination?

H. Wildlife

Big game use on the mesa top is moderate. The area is inhabited by medium and small species of mammals, raptors, game and non-game birds, and reptiles. No live streams or lakes occur within the area affected by the proposed mine operation.

I. Paleontological and Archeological

The area is not a known fossil collecting locality. An inspection for cultural resources was undertaken by Steven R. Simms (B.A., Anthropology, University of Utah, M.A., Anthropology, University of Nevada) under the approval of State Archeologist, David B. Madsen. He found both

areas affected by mining are barren of prehistoric material. Widely scattered historic material was observed, but consisted of debris from relatively recent mining activities (1950's-1964). Due to the shallow depth of soil over most of the impacted area, the possibility of encountering buried deposits is considered remote. The application and report for the inspection are located in the appendix.

J. Recreation

Recreation opportunities on surrounding areas for the general public are limited due to private surface ownership by the Navajo Indian Tribe.

K. Esthetics

The area to be impacted is a mesa top located in a remote generally untravelled region. The impacted area is not within sight of the scenic Monument Valley area. Existing roads will be utilized and the area has been previously mined.

IV. Probable Impacts on Existing Environment

A. Topography

Kelmine Corporation estimates approximately three acres will be disturbed for operations, surface facilities, and storage and disposal areas. Approximately one acre will be disturbed by upgrading an existing road.

As the mining operation is underground, no stripping is needed for actual mining procedures. Two cut and fill pads will be made constructed for surface facilities and waste dumps constructed adjacent to them.

B. Geology and Mining

Underground mining techniques are the most economical and feasible mining method available due to the size, depth, and geology of the deposit.

C. Hydrology

The proposed mining operation is in a desert area. No significant streams cross the impacted area. The surface facilities and waste dumps will be built on the side of an ephemeral wash. All attempts will be made to keep materials out of the bottom of the channel. When revegetated, at the termination of mining, the sediment yield from the area should be comparable to pre-mine conditions. No toxic materials will be produced by mining.

Groundwater was not encountered during exploratory drilling. Aquifers below the Shinarump member should not be affected.

D. Vegetation

The four acres of impacted area will be reseeded at the termination of operations.

E. Range

The range is presently in good condition. Revegetation with a grass-shrub mix should provide comparable conditions with the present. Kelmine is willing to fence the reseeded area, if necessary, until vegetation is again established.

F. Wildlife

Mining operations will not seriously affect wildlife.

G. Soils

Where present, the soil is thin. Stripping, stockpiling, and regrading soil will destroy pedogenic soil horizons and will mix the soil.

H. Recreation

Mining activities will not alter present recreational opportunities.

I. Esthetics

The small mining operation cannot be seen from the scenic Monument Valley area or any frequently travelled road.

J. Socio-Economic

The proposed mine will provide new jobs for a limited number of local Navajo workers and increase local business.

V. Alternatives to the Proposed Action

A. No Action

No action would mean recommending not to mine the mineral deposit that has been previously disturbed.

B. Permit Mining with Specific Constraints

This alternative will provide for development of the deposit along with providing for future productive use of the land affected.

VI. Long Term Vs. Short Term Commitment of Resources

Once mined, the uranium ore will be gone for all future generations. Surface disturbance will be temporary and reclamation will provide for future productive use of the land.

VII. Mitigative Measures to be Utilized

A. Surficial material (soil) will be stripped from surface location pads and spoil dump areas, stock piled, and respread over these areas after they have been regraded to conform to local topography at the termination of operations.

B. Material will be kept out of drainage bottoms and areas subject to flash flooding.

C. Revegeation of mine operation and roadway mixture will be instituted at the termination of operations.

D. Roads will be upgraded with proper water drainage techniques.

E. Extraneous debris, scrap metal and wood, and unusable buildings will be buried or removed.